

DRAFT ENGINEERING EVALUATION
Plant 24142: Bio-Rad Laboratories
487 Aviation Blvd., Suite 100, Santa Rosa, CA, 95403

Application 29244: New Facility-wide Wipe Cleaning Operation (S-1)

BACKGROUND

Bio-Rad Laboratories (Bio-Rad) has applied for an Authority to Construct (AC) and/or a Permit to Operate (PO) the following source at its facility (Plant # 24142) in Santa Rosa, CA:

S-1 Facility-wide wipe cleaning operation, using up to 350 gallons per year of isopropyl alcohol

Bio-Rad manufactures plastic products for use in hospitals, clinics, and laboratories. Bio-Rad has several facilities in Bay Area that manufacture different intermediate and final products. The products manufactured at Santa Rosa plant include optical cap strips, microtiter plates, cell count slides, gel casting cassettes, and combs that serve as intermediate products for use at other Bio-Rad facilities in Bay Area.

These products are manufactured through the plastic injection molding process, in which raw materials known as polymer pellets are heated and injected in to stainless steel molds where the molten plastic cools and solidifies into the final plastic product. Isopropyl alcohol (IPA) is used to wipe clean the stainless-steel molds. It is crucial to the operation to ensure that the molds are free of any oils and debris. The molds are cleaned to ensure parts are produced with no defects. The facility operates a metrology lab, where IPA is used to clean slides and microscopes. S-1 does not involve cleaning of surfaces of any intermediate or final products prior to coating, further treatment, sale, or intended use of these products.

The facility has been operating without a District permit since 2015.

EMISSIONS SUMMARY

IPA is a precursor organic compound (POC) and a toxic air contaminant (TAC). POC and TAC emissions from S-1 were estimated as the product of proposed material usage in gallons, density of the material, and the POC and TAC content in percent by weight in the material. POC and TAC emissions are based on the assumption that 100% of the POC and TAC contained in the material are emitted.

Estimated annual emissions are based on the annual IPA usage proposed by the facility. Corresponding average daily and maximum hourly usage were estimated by assuming 245 days per year and 2 hours per day as source's operating time.

Table 1 summarizes the allowable annual usage of IPA for S-1 and the corresponding estimated daily and hourly usage and estimated annual, daily and hourly emissions.

Table 1 Cleaning Solvent Usage and Emissions at S-1

Cleaning Solvent Used	IPA	
Allowable Annual Usage	350	gal/yr
Estimated Average Daily Usage ¹	1.43	gal/day
Estimated Maximum Hourly Usage ²	0.714	gal/hr
Density of IPA	6.55	lb/gal
% Weight of Solvent in Cleaning Solution	100%	%
Annual IPA Emissions	2293	lb/yr
Average Daily IPA Emissions	9.4	lb/day
Hourly IPA Emissions	4.68	lb/hr
Regulation 2-5 Acute Trigger Level	7.10E+00	lb/hr
Regulation 2-5 Chronic Trigger Level	2.70E+05	lb/yr
HRSA Required	No	Yes/No
1. Average Daily Usage = Annual usage (gal/yr) ÷ 245 days/year 2. Hourly Usage = Annual usage (gal/yr) ÷ 245 days/year ÷ 2 hours/day Maximum Daily POC emissions were assumed to be greater than 10 lb/day since average emissions are above 9 lb/day.		

PLANT CUMULATIVE INCREASE

Table 2 summarizes the cumulative increase at Plant 24142 due to this application.

Table 2 Cumulative Increase

Pollutant	Permitted Emissions (since April 5, 1991)	Emissions Increase with This Application	Cumulative Emissions Increase
	(TPY)	(TPY)	(TPY)
NOx	0.000	0.000	0.000
POC	0.000	1.150	1.150
CO	0.000	0.000	0.000
PM10	0.000	0.000	0.000
SO2	0.000	0.000	0.000
NPOC	0.000	0.000	0.000
PM2.5	0.000	0.000	0.000

HEALTH RISK ANALYSIS (HRA)

S-1 is a new source of TAC emissions and is therefore, subject to regulation 2-5. As shown in Table 1, an HRA is not required for S-1 because emissions of all TACs are below the respective chronic and acute trigger levels in Table 2-5-1 of Regulation 2-5. Therefore, S-1 is expected to comply with Regulation 2-5-301 and 2-5-302.

BEST AVAILABLE CONTROL TECHNOLOGY

Per Regulation 2-2-301.1, BACT is triggered for a District BACT pollutant if a new source has a potential to emit (PTE) 10.0 or more pounds per day of that pollutant. BACT is a source and pollutant specific requirement.

As shown in Table 1, the average daily emissions were estimated by assuming a number for operating days/year. The daily PTE for POC is expected to exceed 10.0 lb/day since the average daily emissions are 9.4 lb/day. Therefore, S-1 is subject to BACT requirements.

BAAQMD BACT Guideline, Document 179B.1, dated 02/04/93 specifies the following as BACT-1:

Wipe cleaning in a hood, booth, or room vented to a control device, w/ emissions controlled to overall capture/destruction efficiency >90%

BACT-1 is typically achieved by a collection system vented to a carbon adsorber or afterburner. Top-down BACT assessment conducted in the past two years for similar size and type of sources (e.g. AN 28424 and 27867) at other facilities determined BACT-1 to be not cost effective for both carbon adsorption and thermal oxidation system. Hence, S-1 will be required to meet BACT-2.

BAAQMD BACT Guideline, Document 179B.1, dated 02/04/93 specify the following as BACT-2:

Minimizing use of solvents; and use of lowest practical vapor pressure solvents; and use of controlled flow solvent dispenser (e.g., squeeze bottle); and all cloths/papers and solvents not in active use kept in closed containers

Bio-rad will be required to minimize its use of solvents to the extent possible. Bio-Rad has informed the District that it has replaced all spray bottles with squeeze bottles and is also considering buying plunger cans. Plunger cans are expected to perform better than squeeze bottles and can capture excess solvent and return it into the can. Both squeeze bottles and plunger cans are considered controlled flow solvent dispenser. S-1 is subject to the storage and disposal requirements of Regulation 8-4-312 and will meet BACT-2 by complying with this regulation, which requires the use of closed containers for storage and disposal of solvent-impregnated materials and use of closed containers for the storage of fresh or spent solvent.

OFFSETS

Regulation 2-2-302 requires offsets for NOx and POC emission increases from any new or modified source if the facility-wide PTE of that pollutant is greater than 10 tons/year. Regulation 2-2-303 requires offsets for PM2.5, PM10, and SO2 emission increases from any new or modified source if the facility-wide PTE of that pollutant is greater than

100 tons/year and if the un-offset cumulative increase in emissions of that pollutant at the facility and any related sources since the baseline date exceeds 1 ton per year.

Table 3: Cumulative Emissions and Offset Requirement

Pollutant	Actual Facility Emissions per Most Recent District Inventory (TPY)	Total Permitted Emissions (Pre- + Post – 4/5/1991) (TPY)	Emissions with This Application (TPY)	Adjusted Total Facility PTE (TPY)	Regulation 2-2-302 and 2-2-303 Offset Triggers (TPY)
NO _x	0.000	0.000	0.000	0.000	Facility PTE > 10 TPY
POC	0.000	0.000	1.150	1.150	Facility PTE > 10 TPY
CO	0.000	0.000	0.000	0.000	NA
PM ₁₀	0.000	0.000	0.000	0.000	Facility PTE > 100 TPY and Cum. Inc. > 1
SO ₂	0.000	0.000	0.000	0.000	Facility PTE > 100 TPY and Cum. Inc. > 1
NPOC	0.000	0.000	0.000	0.000	NA
PM _{2.5}	0.000	0.000	0.000	0.000	Facility PTE > 100 TPY and Cum. Inc. > 1

As shown in Table 3, facility-wide, post-project PTE will not exceed 10 tpy for POC; therefore, offsets are not required for POC emission increases. The project does not result in any emission increases of NO_x, PM_{2.5}, PM₁₀, or SO₂.

NEW SOURCE PERFORMANCE STANDARDS (NSPS)

There are no NSPS rules that apply to S-1.

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP)

There are no NESHAP rules that apply to S-1.

STATEMENT OF COMPLIANCE

Based on the process description of S-1, the District has determined that wipe cleaning of stainless steel molds, slides, and microscope constitutes solvent cleaning and not surface preparation, per Regulation 8-4-220, which is cleaning of surfaces prior to coating, further treatment, sale, or intended use. If S-1 were determined to be surface preparation, then per limited exemption in Regulation 8-4-116 (iii), S-1 would not be subject to the surface preparation standards in Regulation 8-4-313 because S-1 is a part of medical device manufacturing operation.

Wipe cleaning with IPA under S-1, which is determined to be a solvent cleaning operation, is exempt from all requirements in Regulation 8, Rule 16: *Organic Compounds: Solvent Cleaning Operations* per Regulation 8-16-111: *Exemption, Wipe Cleaning*, except for the recordkeeping requirements in Regulation 8-16-501.3. S-1 will comply with the recordkeeping provisions in Section 8-16-501.3, which have been incorporated in the permit conditions. Because wipe cleaning under S-1 is exempt from Regulation 8-16, it is subject to Regulation 8-4, per Regulation 8-16-101. S-1 is subject to Regulation 8-4-302. As currently defined for section 302 of Regulation 8-4, VOC emissions include both POC and NPOC emissions¹. As shown in Table 1, combined POC and NPOC emissions from S-1 are ≤ 5 TPY (1.15 TPY). As such, S-1 is in compliance with Regulation 8-4-302.1 and it is, therefore, not required to meet the emission standards in Regulation 8-4-302.2 and 8-4-302.3.

S-1 is also subject to the evaporative loss minimization requirements, including storage and disposal requirements of Regulation 8-4-312. The owner/operator will comply with Regulation 8-4-312 by using closed containers to store or dispose solvent-impregnated materials such as cloth or paper and closing the containers of solvent when not in use. Regulation 8-4-312.2 does not apply to S-1, because S-1 will not be used for cleanup of spray equipment, including paint lines.

S-1 is also subject to and will comply with the recordkeeping requirements in Regulation 8-4-501.

This application is considered ministerial under the District's Regulation 2-1-311 and is therefore, not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emission factors in accordance with Permit Handbook Chapter 6.3.

¹ Same definition as for VOC in Regulation 1-233 and Regulation 1-236.

S-1 is located less than 1,000 feet from the nearest K-12 school and is therefore, subject to the public notification requirements of Regulation 2-1-412. A public notice will be prepared and sent to all addresses within 1,000 feet of S-1 and parents or guardians of students of the following school(s):

Sonoma County Day School
4400 Day School Place,
Santa Rosa, CA, 95403

The project will not trigger a PSD review because the facility is not a major facility per Regulation 2-2-304.

Major facility review per Regulation 2-6 is also not triggered because this facility is not a major facility, not a phase II acid rain facility, not a subject solid waste incinerator, and not a designated facility.

PERMIT CONDITIONS

COND# 26879-----

Applies to S-1 Wipe Cleaning Operation, Plant 24142, AN 29244

1. The owner/operator of S-1 shall not exceed the following usage limits during any consecutive, rolling twelve-month period at S-1:
100% Isopropyl Alcohol - 350 gallons
(Basis: Cumulative Increase)
2. The owner/operator of S-1 may use alternate cleanup solvent(s) other than the material(s) specified in Part 1, and/or quantities in excess of those specified in Part 1, provided that the owner/operator can demonstrate that all of the following requirements are satisfied:
 - a. Total POC emissions from S-1 do not exceed 2300 pounds in any consecutive 12-month period.
 - b. Total NPOC emissions from S-1 do not exceed 2300 pounds in any consecutive 12-month period.
 - c. The use of these materials does not release toxic emissions above any acute or chronic risk screening trigger level of Table 2-5-1 in Regulation 2-5.
 (Basis: Cumulative Increase, Regulation 2-5)
3. The owner/operator of S-1 shall use only controlled flow solvent dispensers such as squeeze bottles or plunger cans at S-1.
(Basis: Regulation 2-2-301; BACT-2)
4. To determine compliance with the above parts, the owner/operator of S-1 shall maintain the following records:
 - a. Types and quantities of each type of solvent used at S-1 on a monthly basis.
 - b. If a material other than those specified in Part 1 is used, the owner/operator of S-1 shall record the following:
 - i. POC, NPOC, and toxic component contents of each material used; and
 - ii. mass emissions estimates of POC, NPOC, and toxic air contaminant on a monthly basis.

Monthly usage and/or POC, NPOC, and toxic air contaminant emissions shall be totaled for each consecutive, rolling twelve-month period to demonstrate compliance with Part 1 and 2.

All records shall be retained on-site for two years, from the date of entry, and made available for inspection by District staff upon request. These recordkeeping requirements shall not replace the recordkeeping requirements contained in any applicable District Regulations.

(Basis: Cumulative Increase, Regulations 2-5, 8-4, and 8-16)

End of Conditions

RECOMMENDATION

The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue a Permit to Operate for the equipment listed below. However, the proposed source will be located within 1,000 feet of at least one school, which triggers the public notification requirements of Regulation 2-1-412. After the comments are received and reviewed, the District will make a final determination on the permit.

I recommend that the District initiate a public notice and consider any comments received prior to taking any final action on issuance of a Permit to Operate for the following source:

S-1 Facility-wide wipe cleaning operation, using up to 350 gallons per year of isopropyl alcohol

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